# *Do Clinicians Screen Medicaid Patients for Syphilis or HIV When They Diagnose Other Sexually Transmitted Diseases?*

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***Background:*** **Patients diagnosed with gonorrhea or chlamydia are at high risk for HIV and syphilis, and should be offered screening for both.**

***Goal:*** **This study measures HIV and syphilis screening rates among Medicaid patients diagnosed with another sexually transmitted disease (STD).**

***Study Design:*** **Using 1998 Medicaid claims data from 4 states, we identified individuals diagnosed with gonorrhea, urogenital chlamydia, or pelvic inflammatory disease, and then measured the proportion receiving screening tests for HIV and syphilis.**

***Results:*** **Only 25% of STD-diagnosed Medicaid patients received screening tests for syphilis and only 15% for HIV. We found significant state-to-state variability in screening rates.**

***Conclusion:*** **Medicaid patients diagnosed with a nonbloodborne STD represent a high-risk group that is not adequately screened for syphilis and HIV despite repeated contact with medical professionals. Interventions should focus on eliminating missed opportunities for screening these high-risk individuals.**

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PATIENTS DIAGNOSED WITH GONORRHEA or chlamydia are, by definition, at high risk for the development of HIV and/or syphilis, because they have documented person-to-person transfer of at least one sexually transmitted disease (STD). Persons with nonbloodborne STDs have a 2-5 times higher risk of HIV seroconversion than individuals without STDs.[1,2] Therefore, the diagnosis of one sexually transmitted disease is a clear clinical indication for offering blood tests for both syphilis and HIV infection.

STDs are a continuing public health problem for the United States. The use of highly active antiretroviral therapy (HAART) has led to dramatic decreases in HIV deaths, and even decreases in new cases, but a significant increase in the number of individuals living with HIV infection.[3] Risk of HIV infection is significantly increased in persons with syphilis, which is also associated with nonulcerative STDs such as gonorrhea and chlamydia.[4] Despite the wide availability of effective methods of screening, diagnosis, and treatment, there have been significant local upswings in the incidence of syphilis,[5] and a persistently higher incidence in Southern states and in the African American population.[6] Rates of gonorrhea[7] and chlamydia infection[8-10] are once again on the rise. Up to 30% of healthcare costs related to STDs might be paid by public sources such as Medicaid.[11]

In October 1999, the Centers for Disease Control and Prevention (CDC) launched the National Plan to Eliminate Syphilis in the United States.[12] Guidelines for detection and treatment of sexually transmitted diseases from the CDC and the U.S. Public Health Service have long recommended screening for syphilis and HIV antibodies in any person who seeks evaluation or treatment for STD, or any other persons with sexual risk factors.[13,14] In 1997, the Advisory Committee for HIV and STD Prevention (ACHSP) reported that "the evidence was strong that early detection and treatment of other STDs is an effective strategy for preventing sexually transmitted HIV infection."[15] At that time they also raised concern "that this strategy has not been clearly articulated or implemented as a core strategy for HIV prevention in the United States."

There is significant evidence that such guidelines are not followed in many primary care or hospital outpatient settings.[16] A recent national survey of U.S. physicians found that fewer than one third of physicians routinely screened patients for STDs but commonly diagnosed STDs among their patients.[17] When confronted with a positive test, only 7-12% of physicians routinely referred the patient to public health clinics or specialists for treatment, except for follow up of positive HIV tests (60% of physicians). Less than half of physicians routinely reported STD cases to their local health department, and only 9-16% obtained information required to notify sexual partners.

The diagnosis of an STD represents a golden moment of opportunity for counseling the patient about high-risk behaviors related to HIV and syphilis, and screening for asymptomatic, bloodborne infections such as HIV and syphilis. In most primary care encounters, clinicians do not obtain a sexual history or offer STD screening,[18] and even in the context of a diagnosed STD, there could be significant missed opportunities for HIV and syphilis screening. In this study, we attempted to quantify these missed opportunities by measuring the rates of screening for HIV and syphilis in Medicaid patients diagnosed with a nonbloodborne STD such as gonorrhea, urogenital chlamydia, or pelvic inflammatory disease.

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TABLE 1. Profile of Medicaid Populations in Target States vs. U.S. Medicaid Population, 1998

| | Georgia | Indiana | New Jersey | Washington | Four Target States (GA, IN, NJ, WA) | U.S. Medicaid Population* |
|---|---|---|---|---|---|---|
| Total Medicaid enrollees | 1,233,541 | 627,415 | 908,269 | 808,129 | 3,577,354 | 40,649,482 |
| Percent of total U.S. Medicaid population | 3.0 | 1.5 | 2.2 | 2.0 | 8.8 | 100 |
| Percent female | 61.1 | 60.3 | 61.8 | 58.3 | 60.5 | 57.4 |
| Percent black | 53.3 | 24.5 | 35.3 | 6.6 | 33.1 | 24.2 |
| Percent Hispanic or Latino | 3.5 | 4.4 | 22.4 | 12.5 | 10.5 | 15.6 |
| Percent Asian/Pacific | 1.0 | 0.3 | 1.1 | 5.0 | 1.8 | 2.5 |
| Percent Native American/Alaskan Native | 0.1 | 0.1 | 0.2 | 2.8 | 1.0 | 1.0 |
| Medicaid enrollees aged 15–44 (no./percent) | 364,720 (29.6) | 187,947 (30.0) | 286,097 (31.5) | 286,258 (35.4) | 1,125,022 (31.4) | 12,605,927 (31.0) |
| Medicaid enrollees in noncapitated plans (no./percent) | 1,199,787 (97.3) | 526,090 (83.9) | 331,887 (36.5) | 532,513 (65.9) | 2,630,774 (72.7) | 14,722,177 (63.8) |
| Basis of eligibility—Percent child (AFDC or other) | 57.2 | 57.1 | 49.5 | 58.3 | 55.5 | 46.7 |
| Basis of eligibility—Percent adult (AFDC or other) | 16.7 | 16.2 | 18.8 | 21.1 | 18.2 | 19.5 |
| Basis of eligibility—Percent blind/disabled | 18.0 | 15.2 | 19.2 | 13.2 | 16.7 | 16.3 |
| Basis of eligibility—Percent aged | 8.0 | 11.4 | 12.6 | 7.4 | 9.6 | 9.8 |

*HCFA-2082 Report for Federal fiscal year 1998 available at www.cms.gov/medicaid/msis/2082-98.asp.
AFDC = Aid to Family and Dependent Children; HCFA = Health Care Financing Administration.

## Methods

This study used Medicaid claims data from the 1998 State Medicaid Research Files (SMRFs) from 4 states (Georgia, Indiana, New Jersey, and Washington) to identify missed opportunities for HIV and syphilis screening in a high-risk cohort of persons, aged 15-44, diagnosed with gonorrhea, chlamydia, pelvic inflammatory disease, or other nonulcerating STDs. These 4 states were selected by applying the following criteria (in order) to be generally representative of the U.S. Medicaid population:

1. SMRF data available for 1998;
2. Geographic distribution of states spread across the continental United States (one state each from the South, Northeast, Midwest, and West);
3. States midrange among all U.S. states in the size of their Medicaid populations (≥0.5 million and ≤1.5 million enrolled individuals);
4. Encounter-level utilization data available in SMRF data for a majority of Medicaid enrollees (HMO or other capitated managed care enrollment ≤40%); and,
5. Racial–ethnic distribution to make the 4-state aggregate data similar to that of the U.S. Medicaid population.

Data from each state regarding these criteria is presented in Table 1. SMRF files are compiled by the Centers for Medicare and Medicaid Services (CMS, formerly HCFA) from claims data submitted by states to the CMS Medicaid Statistical Information System for production of required state-level reports, and are made available to researchers under specific data use agreements to protect client confidentiality. At the time of this project, 1998 files were the most recent data available. SMRF files represent final action, paid claims for a single calendar year, based on date of service rather than on billing date or date of payment. Data in the SMRF files is divided into one personal summary or enrollment file (one record per unduplicated person) and 4 claims files (one record per billing claim or encounter). Data files are stored securely and confidentially, and the study was conducted with institutional review board approval.

In our 4 target states, there were 3,577,354 individual persons in the Medicaid personal summary (enrollment) files in calendar year 1998, with 1,125,022 between the ages of 15 and 44. Most (92.8%) of these persons had a record of utilizing services as represented by at least one paid claim in at least 1 of the 4 claims files (outpatient, inpatient, long-term care, and drug files). Using International Classification of Diseases, 9th Revision, Clinical Modification diagnosis codes, we extracted a cohort of individuals with an outpatient claim that carried a primary diagnosis of gonorrhea (098.xx), urogenital chlamydia trachomatis and other sexually transmitted diseases (099.xx), and pelvic inflammatory disease (614.0x).[19]

We excluded cases occurring in the first or last months (January and December) of the calendar year to ensure that there was at least a 1-month window of opportunity before and after the STD diagnosis for patients to have received a blood test for syphilis and/or HIV. We also excluded individuals not continuously enrolled in Medicaid for the entire calendar year or those enrolled in capitated managed care plans for any of the study period, because their specific healthcare utilization might not have been captured. Using Current Procedural Terminology-4 procedure codes, we then searched for evidence of HIV or syphilis testing in outpatient claim files.[20]

Analysis of data focused on calculating rates of HIV and syphilis screening among STD-diagnosed patients from each state and generating 95% confidence intervals for these rates. We also conducted logistic regression analysis to determine the impact of variables such as state of residence, age, gender, race, and initial diagnosis on the screening rates.

TABLE 2. Demographic Profile of Patients Diagnosed With Nonbloodborne STDs

| | Unduplicated Persons With Gonorrhea | Unduplicated Persons With Chlamydia | Unduplicated Persons With Pelvic Inflammatory Disease | Unduplicated Persons With Any of These Nonbloodborne STDs |
|---|---|---|---|---|
| Median age (y) | 21 | 24 | 26 | 23 |
| Gender | | | | |
| Male | 211 | 338 | * | † |
| Female | 849 | 1127 | 156 | 2132 |
| Ethnicity | | | | |
| White | 138 | 373 | 46 | 557 |
| Black | 872 | 970 | 95 | 1937 |
| Native American | † | 16 | † | 28 |
| Asian | † | † | † | 13 |
| Hispanic | 14 | 40 | † | † |
| State | | | | |
| Georgia | 840 | 946 | 92 | 1878 |
| Indiana | 102 | 105 | 40 | 247 |
| New Jersey | 68 | 169 | 21 | 258 |
| Washington | 50 | 245 | † | † |
| Total of all states | 1060 | 1464 | 158 | 2683 |

*Two males were miscoded as having pelvic inflammatory disease, which is a clear miscode of either gender or diagnosis.
†Cell sizes are masked to protect confidentiality in accordance with CMS guidelines.
CMS = children's medical services; STDs = sexually transmitted diseases.

## Results

During the period of February through November 1998, there were 5727 events or service encounters in which gonorrhea, chlamydia, or pelvic inflammatory disease was listed as the diagnosis. These claims represented 2683 unique individuals (averaging 2.14 claims per person). A claim could represent one office visit, one lab test, one injection, and so on. A demographic profile of this cohort is shown in Table 2. From this cohort of unduplicated persons diagnosed with STDs, we then found 521 individuals (19.4%) who had either an HIV or syphilis test any time during the calendar year (allowing a 30-day window before and after they could have possibly been diagnosed with an STD to identify all screening events that happened either before or after their STD diagnosis).

Of the 2683 persons diagnosed with a nonbloodborne STD, 2162 (80.6%) were not tested for HIV or syphilis (Table 3). Only 276 (10.3%) persons with an STD diagnosis were tested for HIV, and 429 (16.0%) of persons with an STD diagnosis were tested for syphilis. Only 184 (6.9%) unduplicated individuals with an STD received screening for *both* HIV and syphilis.

Screening rates varied by patient demographics, diagnosis, and state, as shown in Table 3. HIV and syphilis screening rates were 2-3 times higher in high-performing states (New Jersey and Washington) than in low-performing states (Georgia and Indiana), although screening rates were less than 40% in each state. On logistic regression, the variables that predict a higher likelihood of testing status are state of residence, gender (female), and age (15- to 24-year-old and 35- to 44-year-old persons more likely to receive screening compared with young adults aged 25-34 y). The logistic regression showed that racial differences in screening rates were not significant after controlling for diagnosis, state, gender, and age group.

Patients diagnosed with STD in a hospital inpatient setting appear less likely to be screened than patients diagnosed in the outpatient setting, although this could also reflect the bundling of services such as specific lab tests into one hospital bill in the Medicaid claims data. Screening rates were similar between patients with STDs diagnosed in doctors' office settings versus outpatient hospital or emergency departments (15.1% vs. 19.4%).

## Discussion

These data suggest that for the majority of Medicaid patients diagnosed with a nonbloodborne STD, the opportunity to screen for bloodborne pathogens such as HIV and syphilis is completely missed. Although there is significant state-to-state variability, HIV screening rates were less than 25% and syphilis screening rates less than 40% in all 4 states.

The low screening rates and variability suggest that adoption of standard protocols could significantly improve screening rates. The level of screening in the highest-performing state (Washington) is more than 3 times better than the screening rate seen in the lowest-performing state (Georgia), suggesting that there are best practices that might be adopted at a state level to improve performance. Although other studies have suggested similar rates of "missed opportunities" in other practice settings or patient populations, this is the first study to document such underperformance in the low-income, publicly funded Medicaid patient population. Because state Medicaid programs and state health departments are both typically overseen by each state's executive branch, this might also suggest an opportunity for collaborative interventions between Medicaid and state health departments to improve health outcomes in the Medicaid population and to disseminate appropriate STD protocols to private-sector Medicaid providers.

There are several weaknesses inherent in this study. The major weakness of studies using claims data is that if the service is not billed or the claim paid, then the event will not appear in the dataset. Several studies have documented moderately high accuracy rates for Medicaid claims data. For example, Steinwachs et al. showed that 90% of Medicaid claims could be found in the outpatient medical records, with an 82% concordance between diagnosis and date.[21] In our own data, we found 2 of 158 cases of pelvic inflammatory disease assigned to male patients, which obviously represents a miscoding of either gender or diagnosis. Differences in billing efficiency might also produce different rates of capture for medical events occurring in public clinics versus private practice settings.

It is also possible that patients were referred to settings that followed anonymous HIV-testing protocols, or that provided HIV or syphilis screening without billing Medicaid, in which case our

TABLE 3. Syphilis or HIV Screening Rates (%) for STD Patients by Patient Characteristics and Practice Setting, With 95% Confidence Intervals

| | Percent HIV Screened | Percent Syphilis Screened | Percent Either | Percent Both |
|---|---|---|---|---|
| Age grouping (y) | | | | |
| 15–19 | 11.2 (9.7, 12.7) | 15.6 (14.0, 17.2) | 18.9 (17.0, 0.8) | 7.9 (6.6, 9.2) |
| 20–34 | 7.2 (5.3, 9.1) | 15.4 (13.0, 17.8) | 19.0 (16.0, 2.0) | 3.6 (2.2, 5.0) |
| 35–44 | 11.9 (8.8, 15.0) | 18.1 (14.0, 22.2) | 21.9 (18.0, 5.8) | 8.1 (5.5, 10.7) |
| Gender | | | | |
| Male | 8.7 (6.4, 11.0) | 17.8 (15.0, 20.6) | 20.0 (17.0, 23.0) | 6.5 (4.5, 8.5) |
| Female | 10.7 (9.4, 12.0) | 15.5 (14.0, 17.0) | 19.3 (18.0, 25.8) | 6.9 (5.9, 7.9) |
| Ethnicity | | | | |
| White | 13.5 (11.0, 16.0) | 22.1 (19.0, 25.2) | 27.8 (24.0, 31.6) | 7.7 (5.5, 9.9) |
| Black | 8.9 (7.6, 10.2) | 14.0 (12.0, 16.0) | 16.3 (15.0, 17.6) | 6.6 (5.5, 7.7) |
| Native American | 35.7 (17.0, 54.4) | 14.3 (4.7, 23.9) | 39.3 (20.0, 58.6) | 10.7 (0, 23.0) |
| Asian | 15.4 (0, 38.0) | 23.1 (0, 50.0) | 30.8 (1.7, 59.9) | 7.7 (0, 24.0) |
| Hispanic | 13.3 (4.5, 22.1) | 18.3 (8.3, 28.3) | 25.0 (14.0, 36.0) | 6.7 (1.7, 11.7) |
| STD diagnosis | | | | |
| Gonorrhea | 9.7 (7.9, 14.7) | 13.3 (11.0, 15.6) | 15.9 (14.0, 17.8) | 7.1 (5.5, 8.7) |
| Chlamydia | 11.3 (9.7, 12.9) | 18.8 (17, 20.6) | 23.0 (21.0, 23.0) | 7.2 (5.8, 8.6) |
| PID | 4.4 (1.2, 7.6) | 7.6 (3.4, 11.8) | 9.5 (4.9, 14.1) | 2.5 (0, 5.0) |
| State | | | | |
| Georgia | 6.5 (5.4, 7.6) | 9.9 (8.6, 11.2) | 12.2 (11.0, 13.4) | 4.2 (3.3, 5.1) |
| Indiana | 11.7 (7.7, 15.7) | 14.6 (10.0, 19.2) | 17.0 (12.0, 22.0) | 9.3 (5.7, 12.9) |
| New Jersey | 21.7 (17.0, 26.4) | 39.5 (34.0, 44.9) | 43.0 (37.0, 49.0) | 18.2 (13.0, 23.4) |
| Washington | 22.7 (18.0, 27.4) | 35.0 (30.0, 40.0) | 46.0 (40.0, 52.0) | 11.7 (8.0, 15.4) |
| Practice setting (where first STD was diagnosed) | | | | |
| Office | 15.1 (12.0, 18.2) | 25.6 (22.0, 29.2) | 31.2 (28.0, 34.4) | 9.5 (7.2, 11.8) |
| Inpatient hospital | 6.7 (4.2, 9.2) | 10.6 (7.5, 13.7) | 15.0 (11.0, 19.0) | 2.3 (0, 4.6) |
| Nursing home | 2.9 (0, 5.1) | 7.9 (4.5, 11.3) | 9.2 (5.5, 12.9) | 1.7 (0, 3.3) |
| Outpatient hospital/ER/clinic | 19.4 (16.0, 22.8) | 25.6 (21.0, 30.2) | 31.0 (26.0, 31.0) | 14.0 (11.0, 17.0) |
| Other | 7.8 (5.7, 9.9) | 10.4 (7.9, 12.9) | 11.9 (9.4, 14.4) | 6.2 (4.3, 8.1) |
| Overall screening rate (all patients) | 10.3% (9.1, 11.5) | 16.0% (15.0, 17.0) | 19.4% (18.0, 20.8) | 6.9% (5.9, 7.9) |

PID = pelvic inflammatory disease; STD = sexually transmitted disease.

study would underestimate screening rates. However, the only cases analyzed in this study were patients whose gonorrhea or chlamydia was already diagnosed, billed, and paid by the Medicaid program. There is also some evidence that managed care organizations (MCOs), especially staff-model and group-model MCOs with centralized data management, might have higher rates of STD reporting and potentially higher screening rates.[22] Patients in globally capitated MCOs such as health maintenance organizations would not generate encounter-level data in the 1998 Medicaid SMRF file and were therefore excluded from our analysis. Because of these factors, screening rates for the Medicaid population might have been somewhat underestimated, and the variability in screening rates might have been overestimated.

The major strength of using claims data for this study is that it allows us to track medical encounters and screening events for a given patient population regardless of where the service is provided as long as a bill is generated and the claim is paid. Services provided by doctors' offices, public clinics, outpatient hospital departments, and even reference labs should be captured in this dataset. In fact, the only patients evaluated for screening in this study not only had a diagnosed STD, but were only identified in the denominator because their STD episode appeared in at least one medical encounter that was effectively billed and paid as a final action claim in this same Medicaid dataset. Therefore, it is not unreasonable to expect that this same group of patients might have a Medicaid bill generated and claim paid if the provider who diagnosed their STD chose to order a blood screening test for HIV or syphilis.

## Conclusions

This study demonstrates low HIV and syphilis screening rates for patients with a newly documented STD in a 4-state sample with similar demographics to the overall U.S. Medicaid population. More often than not, these high-risk STD patients were not screened appropriately for bloodborne pathogens such as HIV and syphilis. This has potentially adverse effects for the patient, but it also represents a huge gap in our national strategy for controlling the spread of HIV and for eliminating syphilis. Although more research can be done to validate these results using other data sources, every clinician and every health system must work to improve their practices, procedures, systems, and protocols to eliminate missed screening opportunities and to assure that every patient diagnosed with a nonbloodborne STD is screened for HIV and syphilis. State Medicaid programs could also play a critical role by working with public health officials to educate Medicaid providers and to monitor HIV and syphilis screening rates among Medicaid clients diagnosed with other STDs.

## References

1. Kassler WJ, Zenilman JM, Erickson B, Fox R, Peterman TA, Hook EW III. Seroconversion in patients attending sexually transmitted disease clinics. AIDS 1994; 8:351-355.
2. Otten MW Jr, Zaidi AA, Peterman TA, Rolfs RT, Witte JJ. High rate of HIV seroconversion among patients attending urban sexually transmitted disease clinics. AIDS 1994; 8:549-553.

3. Centers for Disease Control and Prevention. Update. AIDS—United States, 2000. MMWR Morb Mortal Wkly Rep 2002; 51:592-595.
4. Belongia EA, Danila RN, Angamuthu V, et al. A population-based study of sexually transmitted disease incidence and risk factors in human immunodeficiency virus-infected people. Sex Transm Dis 1997; 24:251-256.
5. Centers for Disease Control and Prevention. Outbreak of primary and secondary syphilis—Baltimore City, Maryland 1995. MMWR Morb Mortal Wkly Rep 1996; 45:166-169.
6. St. Louis ME, Farley TA, Aral SO. Untangling the persistence of syphilis in the South. Sex Transm Dis 1996; 23:1-4.
7. Centers for Disease Control and Prevention. Gonorrhea—United States, 1998. MMWR Morb Mortal Wkly Rep 2000; 49:538-542.
8. Centers for Disease Control and Prevention. Summary of notifiable diseases—United States, 2000. MMWR Morb Mortal Wkly Rep 2002; 49:1-102.
9. Centers for Disease Control and Prevention. Chlamydia screening practices of primary-care providers—Wake County, North Carolina, 1996. MMWR Morb Mortal Wkly Rep 1997; 46:819-822.
10. Centers for Disease Control and Prevention. Chlamydia prevalence and screening practices—San Diego County, California 1993. MMWR Morb Mortal Wkly Rep 1994; 43:366-369.
11. Washington AE, Katz P. Cost of and payment source for pelvic inflammatory disease. Trends and projections, 1983 through 2000. JAMA 1991; 266:2565-2569.
12. Division of STD Prevention, National Center for HIV, STD, TB Prevention, Centers for Disease Control, Prevention. National Plan to Eliminate Syphilis in the United States. Available on-line at http://www.cdc.gov/stopsyphilis/Plan.pdf. Accessed October 1999.
13. U.S. Preventive Services Task Force. Guide to Clinical Preventive Services, 2nd ed. Baltimore: Williams & Wilkins, 1996.
14. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2002. MMWR Morb Mortal Wkly Rep 2002; 51:1-80.
15. Centers for Disease Control and Prevention. HIV prevention through early detection and treatment of other sexually transmitted diseases—United States recommendations of the Advisory Committee for HIV and STD Prevention. MMWR Morb Mortal Wkly Rep 1998; 47:1-24.
16. Hessol NA, Priddy FH, Bolan G, et al. Management of pelvic inflammatory disease by primary-care physicians. A comparison with Centers for Disease Control and Prevention guidelines. Sex Transm Dis 1996; 23:157-163.
17. St. Lawrence JS, Montano DE, Kasprzyk D, Phillips WR, Armstrong K, Leichliter JS. STD screening, testing, case reporting, and clinical and partner notification practices: a national survey of U.S. physicians. Am J Public Health 2002; 92:1784-1788.
18. Centers for Disease Control and Prevention. HIV prevention practices of primary-care physicians—United States, 1992. MMWR Morb Mortal Wkly Rep 1994; 42:988-992.
19. American Medical Association. International Classification of Disease, Ninth Revision (ICD-9-CM). Chicago: AMA Press, 1998.
20. American Medical Association. Current Procedural Terminology (CPT) 1998 Procedure Codes. Chicago: AMA Press, 1998.
21. Steinwachs DM, Stuart ME, Scholle S, Starfield B, Fox MH, Weiner JP. A comparison of ambulatory Medicaid claims to medical records: a reliability assessment. Am J Med Qual 1998; 13:63-69.
22. Centers for Disease Control and Prevention. Reporting of laboratory-confirmed chlamydial infection and gonorrhea by providers affiliated with three large managed care organizations—United States, 1995–1999. MMWR Morb Mortal Wkly Rep 2002; 51: 256-259.